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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,548	12/19/2001	Dallas K. Pierson	10309US01	2468

7590 08/05/2004

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EXAMINER	
PHAM, HAI CHI	

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 08/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/028,548	PIERSON, DALLAS K.	
	Examiner	Art Unit	
	Hai C Pham	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-33 and 35-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-3,5-15,23-33 and 35-37* is/are allowed.

6)☒ Claim(s) *16,17,19,20,22,38 and 39* is/are rejected.

7)☒ Claim(s) *18, 21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. Prosecution on the merits of this application is reopened on claim 22 considered unpatentable for the reasons indicated below:

- Claim 22 recites the following limitation "wherein varying the breadth of the swath comprises varying the breadth of the swath as function of the set of data and a mask", which is found taught by Yen et al. (U.S. 5,992,962), cited in the previous Office action. In fact, the breadth of the swath is defined by the boundary of the set of logical values corresponding to the pixels being printed. Yen et al. teaches the use of a mask for printing dots based on the inputted image data and the patterns of the mask and the resulting printed swath is conform with the zigzag boundary of the mask patterns.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yen et al. (U.S. 5,992,962) in view of Klassen et al. (U.S. 5,677,714).

Yen et al., an acknowledge prior art, discloses print masks for inkjet printers, the print masks having triangular patterns formed by solid black dots (or printed dots) and open dots (or absence of dots), the open dots corresponding to the nozzles being turned off while the solid black dots correspond to the nozzles being activated to print dots so as a multipass staggered-swath printing is performed. Yen et al. teaches:

- (referring to claim 16) the print mask comprising a first subset mask and a second subset mask (lower mask 1-L corresponding to lines 1-48 and upper mask 1-U corresponding to lines 49-96) (Fig. 6), each subset mask comprising at least one set of first patterns (solid black dots) and at least one set of second patterns (open dots), wherein the set of first patterns in the first subset mask has a first triangle-like shape and wherein the set of first patterns in the second subset mask has a second triangle-like shape (the triangular pattern formed by the solid black dots of the lower mask 1-L and that formed by the solid black dots of the upper mask 1-U having different geometrically oriented shapes).

Although Yen et al. does not explicitly teach that the solid black dots and open dots constitute sets of first and second logical values, e.g. binary "1" and "0" values, Yen et al. does however indicate that the print masks can be implemented as either a hardware or software driver to drive the print head, e.g., open (activate) or muffle (deactivate) the various nozzles. It is well known in the art that such software-driven print masks include a matrix set of logical values of "1" and "0", to determine whether the pixel is turned OFF or turned ON as evidenced by Klassen et al., which discloses a

print mask (300, Fig. 8) as a software-generated mask or performed by hardware logic, the print mask being composed of logical 1 and logical 0, which determine the ON state and OFF state of the specific pixel, respectively, and thus determine the activation and deactivation of the specific nozzle of the ink jet printer, respectively (col. 4, line 52 to col. 5, line 4).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to implement the print mask of Yen et al. to have binary values as taught by Klassen et al. since it was known in the printing art that a software-driven print mask is composed of logical values of 1's and 0's.

On the other hand, it is noted that the intended use statement in each of the claim 16 implies no apparent structure of the mask being specifically configured to be adapted for use in a laser thermal printer. The mask as claimed may be applied to a variety of technological fields besides a laser thermal printer and thus the recitation of a laser thermal printer in relation to the mask does not limit the structure of the mask itself. The intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. (MPEP 2111.02).

Yen et al. further teaches:

- (referring to claim 17) the print mask extending in a first direction (horizontal direction or row) and a second direction (vertical direction), wherein each of the triangle-like shapes includes a base and a peak, wherein the bases of the triangle-like shapes are oriented in the first direction, and wherein the first subset

(lower mask 1-L or lines 1-48) is spatially proximate to the second subset mask (upper mask 1-U or lines 49-96) in the second direction (see Fig. 6).

4. Alternatively, claims 16-17, 19-20, 22, 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yen et al. in view of Kanematsu et al. (U.S. 6,183,055 B1).

Yen et al. discloses print masks for inkjet printers, the print masks having a first set of first patterns formed by solid black dots (or printed dots) in the lower mask 1-L, a second set of first patterns formed by solid blacks (or printed dots) in the upper mask 1-U, a set of second patterns formed by open dots (or absence of dots), wherein the first set of first patterns of black dots is spatially clustered in a first triangle-like shape and the second set of first patterns of black dots is spatially clustered in a second [geometrically oriented] triangle-like shape (see Fig. 6).

Although Yen et al. does not explicitly teach that the solid black dots and open dots constitute sets of first and second logical values, e.g. binary "1" and "0" values, Yen et al. does however indicate that the print masks can be implemented as either a hardware or software driver to drive the print head, e.g., open (activate) or muffle (deactivate) the various nozzles. It is well known in the art that such software-driven print masks include a matrix set of logical values of "1" and "0", to determine whether the pixel is created or not as evidenced by Kanematsu et al., which discloses a print mask as a software-generated mask (random mask creating means 1008, Fig. 10), the print mask being composed of logical value 1 and logical value 0 (Figs. 5B-5D), which determine the ON state and OFF state of the specific pixel, respectively, by executing

the logical AND operation between the bit map image data and the mask (col. 9, line 15 to col. 10, line 67).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to implement the print mask of Yen et al. to have binary values as taught by Kanematsu et al. since it was known in the printing art that a software-driven mask is constituted by logical values of 1's and 0's.

With regard to claim 19, Yen et al. discloses printing a swath on a recording medium as a function of a set of data (image data and mask pattern) and varying the breadth of the swath during printing (the varying width of the printed swath being conform with the zigzag boundary of the solid dots or patterns of the mask, and since the mask is applied during the printing operation the breadth of the swath is varied during printing).

However Yen et al. fails to teach printing on a laser thermal printer (claim 19) and the logical values of the mask being a function of a random element (claim 38).

Regardless, Kanematsu et al. teaches the software-driven mask being created based on a random number (Fig. 5A) for generating the logical values 1s and 0s of the random mask (Figs. 5B-5D). Kanematsu et al. further teaches the above software-driven mask being applicable to different types of recording techniques including the ink jet and laser thermal printing engines (col. 16, lines 23-29).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a software-driven random mask suitable for all types of printing engines as taught by Kanematsu et al. in the device of Yen et al.

The motivation for doing so would have been to provide a flexible masking rate of the image data adapted to the recording apparatus.

Allowable Subject Matter

5. Claims 1-3, 5-15 and 23-33, 35-37 are allowed.

6. Claims 18 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is an examiner's statement of reasons for allowance: the primary reason for the indication of the allowability of claim 1 is the inclusion therein, in combination as currently claimed, of the limitation "wherein the spatial frequency of the first set of first logical values spatially clustered in the first triangle-like shape and the second set of first logical values spatially clustered in the second triangle-like shape is greater than the spatial frequency of neighboring halftone dots", which is not found taught the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claims 12, 23, 27, is the inclusion therein, in combination as currently claimed, of the limitation regarding the triangle-like shapes of the first and second sets of the first logical values being different, which is not found taught the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claim 18 is the inclusion therein, in combination as currently claimed, of the limitation "wherein the

peaks of the triangle-like shapes are unaligned in the second direction", which is not found taught the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claims 19, 31, 35, is the inclusion therein, in combination as currently claimed, of the limitation regarding the contraction and expansion of the breadth of the swath being irregular", which is not found taught the prior art of record considered alone or in combination.

Claims 2-3, 5-11, 13-15, 20-22, 24-26, 28-30, 32-33 and 36-37 are allowed because they are directly or indirectly dependent from claims 1, 12, 23, 27, 31 and 35 above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

8. Applicant's arguments filed 05/28/04 have been fully considered but they are not persuasive with regard to claims 16 and 38, since there is no indication that the first and second triangle-like shapes are different from each other. Yen et al. discloses a mask constituted by a first and second subset masks wherein the patterns for printed dots in each of the subset masks have triangle-like shapes oriented differently from one o another.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HAI PHAM
PRIMARY EXAMINER

August 2, 2004